

REMARKS

Claims 1-18, as amended, remain herein. Claims 13 and 14 also remain herein but are presently withdrawn. Claims 1-12 and 15-17 have been amended. Support for the amendments may be found throughout the specification (see, e.g., FIGS. 5(d) and (e), page 49, lines 1-16 of applicants' specification).

1. Applicants hereby confirm their provisional election, with traverse, to prosecute the claims of Group 1 (claims 1-12 and 15-18) in the present application.

Applicants respectfully traverse the restriction requirement since the subject matter of all of claims 1-18 is sufficiently related that a thorough and complete search for the subject matter of the elected claims would necessarily encompass a thorough and complete search for the subject matter of the non-elected claims. Thus, search and examination of the entire application could be made without serious burden. See MPEP §803 which states that "[i]f the search and examination of an entire application can be made without serious burden, the Examiner must examine it on the merits." This policy should apply in the present application to avoid unnecessary delay and expense to applicants and duplicative examination by the Patent Office. Applicants therefore request withdrawal of the requirement and examination of all claims in the present application.

2. Claim 12 was rejected under 35 U.S.C. § 112, second paragraph. Claim 12 has been amended to moot this rejection.

3. Claims 1, 5, 6, 8-10, 12, 15 and 18 were rejected under 35 U.S.C. § 102(b) over Kuronuma et al. JP 2003-266090.

Applicants' claim 1 recites a method for treating hardly-decomposable-substance-containing water, which comprises: (B) adsorption treatment by adding an adsorbent to raw water containing a hardly decomposable substance to cause the hardly decomposable substance to be adsorbed on said adsorbent, (C) a plurality of membrane filtering treatments thereby separating permeated liquid by passing the adsorbent-containing water through a plurality of filter membranes to concentrate the adsorbent with said hardly decomposable substance adsorbed thereon, and (D) chemically decomposing the hardly decomposable substance adsorbed on said concentrated adsorbent with a peroxide without any desorption from said adsorbent.

Applicants' claim 15 recites a method for concentrating a hardly decomposable substance in hardly-decomposable-substance-containing water, which comprises: (B) adsorption treatment by adding an adsorbent to raw water containing a hardly decomposable substance to cause the hardly decomposable substance to be adsorbed on said adsorbent, and (C) a plurality of membrane filtering treatments thereby separating a permeated liquid by passing the adsorbent-containing water through a plurality of filter membranes to concentrate the adsorbent with said hardly decomposable substance adsorbed thereon.

Kuronuma does not disclose applicants' claimed methods comprising a plurality of membrane filtering treatments of permeated liquid through a plurality of filter membranes. In Kuronuma, the treated water is not subjected to additional membrane filtering treatments. As demonstrated in applicants' specification, applicants' claimed additional membrane filtering treatments bring the concentration of the hardly decomposable substance in the permeated liquid under the environmental standard limit (see page 50 of applicants' specification).

Thus, Kuronuma does not disclose all elements of applicants' claims and, therefore, it is not an adequate basis for rejection under § 102(b). Applicants respectfully request reconsideration and withdrawal of this rejection.

4. Claim 2 was rejected under 35 U.S.C. § 103(a) over Kuronuma.

Applicants' claim 2 recites a method for treating hardly-decomposable-substance-containing water according to claim 1, wherein said peroxide is used in an amount of at least 100 times larger in molar relative to that of said hardly decomposable substance.

The Office Action admits that Kuronuma does not disclose applicants' claimed peroxide amount but states that the amount of peroxide is obvious and can be determined through routine experimentation. However, evidence that the claimed invention yields unexpectedly improved properties, or properties not present in the prior art rebuts an obviousness rejection. See In re Dillon, 919 F.2d 688, 692-93 (Fed. Cir. 1990); MPEP § 2145. Applicants' specification explains that:

The persulfate includes ammonium persulfate, sodium persulfate, potassium persulfate, potassium hydrogen persulfate, lead persulfate and rubidium persulfate. As an oxidizing agent, persulfates such as ammonium persulfate, sodium persulfate and potassium persulfate are particularly preferred. These may be used singly or may be used in combination of two compounds or more of these. The amount thereof based on the molar amount of the hardly decomposable substance adsorbed on the adsorbent is preferably at least 100 times by mole, more preferably in the range of 10^4 to 10^{12} times by mole, still more preferably 10^7 to 10^{10} times by mole. When the molar amount of the peroxide is at least 100 times the molar amount of the hardly decomposable substance, the hardly decomposable substance adsorbed on the adsorbent can be stably chemically decomposed to such an amount that is the emission standard value (3,000 pg-TEQ/g) of industrial waste or less even if the concentration of the hardly decomposable substance in the hardly-decomposable-substance-containing water varies.

Applicants' specification, page 35, line 26 to page 36, line 15 (emphasis added here). In addition, claim 2 depends from claim 1 and, as discussed above, Kuronuma does not disclose all elements of claim 1.

Thus, Kuronuma does not disclose all elements of applicants' claims. In addition, Kuronuma discloses nothing that would have suggested applicants' claimed invention to one of ordinary skill in this art. There is no disclosure or teaching in Kuronuma or otherwise in this record, that would have suggested the desirability of modifying any portions thereof effectively to anticipate or suggest applicants' presently claimed invention. Applicants respectfully request reconsideration and withdrawal of this rejection.

5. Claims 3 and 16 were rejected under 35 U.S.C. § 103(a) over Kuronuma in view of Yamanaka et al. U.S. Patent Application Publication 2003/0173282.

Applicants' claims 3 and 16 recite a method for treating hardly-decomposable-substance-containing water further comprising (A) a membrane concentrating treatment separating permeated liquid from the water containing a hardly decomposable substance by passing it through a reverse osmosis membrane or a nano-filter membrane, to concentrate the hardly decomposable substance.

Contrary to the assertion in the Office Action, Yamanaka does not disclose separating permeated liquid from water containing the hardly decomposable substance and concentrating the hardly decomposable substance. Instead, Yamanaka discloses removal of suspended and organic substances through filtration and adsorption in an active carbon column, then removal of ions and TOCs through reverse osmosis to purify water. Yamanaka says nothing about using reverse osmosis to concentrate hardly decomposable substances. In addition, Yamanaka relates

to high purity water and one of ordinary skill in the art would not combine Yamanaka with Kuronuma and would not be motivated to use Yamanaka's reverse osmosis to concentrate hardly decomposable substances.

Furthermore, claims 3 and 16 depend from claims 1 and 15, respectively, and, as discussed above, Kuronuma does not disclose all elements of either claim 1 or 15. Further, Yamanaka does not teach or suggest what is missing from Kuronuma with respect to claims 1 and 15.

Thus, neither Kuronuma nor Yamanaka discloses all elements of applicants' claims. In addition, Kuronuma and Yamanaka disclose nothing that would have suggested applicants' claimed invention to one of ordinary skill in this art. There is no disclosure or teaching in Kuronuma, Yamanaka, or otherwise in this record, that would have suggested the desirability of modifying any portions thereof effectively to anticipate or suggest applicants' presently claimed invention. Applicants respectfully request reconsideration and withdrawal of this rejection.

6. Claims 4 and 11 were rejected under 35 U.S.C. § 103(a) over Kuronuma in view of Obata et al. U.S. Patent 5,571,419.

Obata relates to high purity water. One of ordinary skill in the art would not have combined Obata with Kuronuma. Obata discloses removing residual chlorine from city water, i.e. pre-treated water, while Kuronuma relates to water containing hardly decomposable substances. In addition, Obata uses persulfate as an oxidizing agent to decompose urea and other TOCs, but says nothing about decomposing hardly decomposable substances such as dioxins.

In addition, claims 4 and 11 depend from claim 1, and, as discussed above, Kuronuma does not disclose all elements of claim 1. Further, Obata does not teach or suggest what is missing from Kuronuma with respect to claim 1.

Thus, neither Kuronuma nor Obata discloses all elements of applicants' claims. In addition, Kuronuma and Obata disclose nothing that would have suggested applicants' claimed invention to one of ordinary skill in this art. There is no disclosure or teaching in Kuronuma, Obata, or otherwise in this record, that would have suggested the desirability of modifying any portions thereof effectively to anticipate or suggest applicants' presently claimed invention. Applicants respectfully request reconsideration and withdrawal of this rejection.

7. Claim 7 was rejected under 35 U.S.C. § 103(a) over Kuronuma in view of Krulik et al. U.S. Patent 6,652,758.

Applicants' claim 7 recites a method for treating hardly-decomposable-substance-containing water according to claim 1, further comprising (H) flocculation separation by adding a flocculating agent to water containing the adsorbent with the hardly decomposable substance adsorbed thereon, to flocculate and separate the adsorbent with the hardly decomposable substance adsorbed thereon.

Contrary to the assertion in the Office Action Krulik does not disclose adding a flocculating agent to flocculate the adsorbent. Instead, Krulik adds a calcium salt to precipitate calcium fluoride. The Office Action states that Krulik component (112) is the adsorbent, but it is an oxidizer (see FIG. 1 and column 4, lines 27). In addition, the precipitated substance is calcium fluoride, which is the impurity sought to be eliminated, not an adsorbent with the hardly decomposable substance adsorbed thereon.

In addition, claim 7 depends from claim 1, and, as discussed above, Kuronuma does not disclose all elements of claim 1. Further, Krulik does not teach or suggest what is missing from Kuronuma with respect to claim 1.

Thus, neither Kuronuma nor Krulik discloses all elements of applicants' claims. In addition, Kuronuma and Krulik disclose nothing that would have suggested applicants' claimed invention to one of ordinary skill in this art. There is no disclosure or teaching in Kuronuma, Krulik, or otherwise in this record, that would have suggested the desirability of modifying any portions thereof effectively to anticipate or suggest applicants' presently claimed invention. Applicants respectfully request reconsideration and withdrawal of this rejection.

8. Claim 17 was rejected under 35 U.S.C. § 103(a) over Kuronuma in view of Yamanaka and Nowlin et al. U.S. Patent 4,332,685.

Applicants' claim 17 recites a method for concentrating a hardly decomposable substance in hardly-decomposable-substance-containing water according to claim 16, wherein at least part of the hardly decomposable substance concentrated in (A) is returned to said raw water containing a hardly decomposable substance.

A person of ordinary skill in the art would not have been motivated to combine Kuronuma, Yamanaka, and Nowlin. Indeed, Nowlin recycles waste water to provide a reverse osmosis water treatment system that produces no waste water (see Nowlin, column 1, lines 65-68). Nowlin explains that the recycled waste water is diluted substantially by the hard water in line 15 and tank 13 (see Nowlin, column 3, lines 43-45). On the other hand, in applicants' claimed invention, the purpose of returning the hardly decomposable substance to the raw water is to concentrate the hardly decomposable substance as much as possible prior to the chemical

decomposition step (applicants' specification, page 55, lines 2-9).

In addition, claim 17 depends from claim 16, and, as discussed above, Kuronuma and Yamanaka do not disclose all elements of claim 16. Further, Nowlin does not teach or suggest what is missing from Kuronuma and Yamanaka with respect to claim 16.

Thus, none of Kuronuma, Yamanaka, and Nowlin discloses all elements of applicants' claims. In addition, Kuronuma, Yamanaka, and Nowlin disclose nothing that would have suggested applicants' claimed invention to one of ordinary skill in this art. There is no disclosure or teaching in Kuronuma, Yamanaka, Nowlin, or otherwise in this record, that would have suggested the desirability of modifying any portions thereof effectively to anticipate or suggest applicants' presently claimed invention. Applicants respectfully request reconsideration and withdrawal of this rejection.

Accordingly, all claims 1-12 and 15-18 are now fully in condition for allowance and a notice to that effect is respectfully requested. The PTO is hereby authorized to charge/credit any fee deficiencies or overpayments to Deposit Account No. 19-4293. If further amendments would place this application in even better condition for issue, the Examiner is invited to call applicants' undersigned attorney at the number listed below.

Respectfully submitted,

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